CLAIMS

[1] A method for generating plasma comprising the steps of providing a narrow portion in a flow channel made of an insulation material, the narrow portion having a cross-sectional area markedly smaller than a cross-sectional area of the flow channel; filling the flow channel and the narrow portion with a conductive liquid, and thereafter applying an electric field to the narrow portion, to conduct the electric field through said narrow portion, thereby generating plasma at said narrow portion.

[2] The method for generating plasma according to claim 1, wherein the electric field is applied to the narrow portion to form bubbles at the narrow portion, and plasma is generated in the formed bubbles.

[3] The method for generating plasma according to claim 1, wherein each of the length in a thickness direction and the length in a width direction of the flow channel is from 2 μm to 30 mm, and wherein the length of the direction of an electric field at the narrow portion is from 2 μm to 3 mm, and wherein each of the length in a thickness direction and the length in a width direction of the narrow portion is from 0.5 μm to 1 mm, and wherein the flow channel comprises the narrow portion having a cross-sectional area markedly smaller than a cross-sectional area of the flow channel.

[4] The method for generating plasma according to claim 1, wherein a ratio of the cross-sectional area of the flow channel to the cross-sectional area of the narrow portion (the cross-sectional area of the flow channel/the cross-sectional area of the narrow portion) is 3 or more.

[5] The method for generating plasma according to claim 1, wherein the

time period for applying an electric field is from 1 μs to 500 ms in single application of the electric field.

[6] The method for generating plasma according to claim 1, wherein in a case where electric field is applied plural times, the conductive liquid is migrated after the application of the electric field and before the subsequent application of the electric field.

[7] A method for elemental analysis comprising the steps of providing a narrow portion in a flow channel made of an insulation material, the narrow portion having a cross-sectional area markedly smaller than a cross-sectional area of the flow channel; filling the flow channel and the narrow portion with a conductive liquid for identification or quantification of elements, and thereafter applying an electric field to the narrow portion to conduct the electric field through the said narrow portion, thereby generating plasma at said narrow portion; and subjecting light from the generated plasma to spectroscopy.

[8] The method for elemental analysis according to claim 7, wherein the electric field is applied to the narrow portion to form bubbles at the narrow portion, and plasma is generated in the formed bubbles.

[9] The method for elemental analysis according to claim 7, wherein each of the length in a thickness direction and the length in a width direction of the flow channel is from 2 μm to 30 mm, and wherein the length of the direction of an electric field at the narrow portion is from 2 μm to 3 mm, and wherein each of the length in a thickness direction and the length in a width direction of the narrow portion is from 0.5 μm to 1 mm, and wherein the flow channel comprises a narrow portion having a

cross-sectional area markedly smaller than a cross-sectional area of the flow channel.

[10] The method for elemental analysis according to claim 7, wherein a ratio of the cross-sectional area of the flow channel to the cross-sectional area of the narrow portion (the cross-sectional area of the flow channel/the cross-sectional area of the narrow portion) is 3 or more.

[11] The method for elemental analysis according to claim 7, wherein the time period for applying an electric field is from 1 μs to 500 ms in single application of the electric field.

[12] The method for elemental analysis according to claim 7, wherein in a case where electric field is applied plural times, the conductive liquid is migrated after the application of the electric field and before the subsequent application of the electric field.

[13] The method for elemental analysis according to claim 7, wherein a given electrolyte is previously added to the conductive liquid to adjust electroconductivity of the conductive liquid.

[14] An apparatus for generating plasma in a conductive liquid, the apparatus for generating plasma comprising a narrow portion in a flow channel made of an insulation material, the narrow portion having a cross-sectional area markedly smaller than a cross-sectional area of the flow channel; and a means of applying an electric field to the narrow portion to conduct the electric field through the narrow portion.

[15] The apparatus for generating plasma according to claim 14, wherein the apparatus comprises a pair of electrodes arranged in the flow channel in a manner that the narrow portion is sandwiched therewith.

[16] The apparatus for generating plasma according to claim 14, wherein each of the length in a thickness direction and the length in a width direction of the flow channel is from 2 μm to 30 mm, and wherein the length of the direction of an electric field at the narrow portion is from 2 μm to 3 mm, and wherein each of the length in a thickness direction and the length in a width direction of the narrow portion is from 0.5 μm to 1 mm, and wherein the flow channel comprises a narrow portion having a cross-sectional area markedly smaller than a cross-sectional area of the flow channel.

[17] The apparatus for generating plasma according to claim 14, wherein a ratio of the cross-sectional area of the flow channel to the cross-sectional area of the narrow portion (the cross-sectional area of the flow channel/the cross-sectional area of the narrow portion) is 3 or more.

[18] The apparatus for generating plasma according to claim 14, wherein the narrow portion is detachably arranged.

[19] An apparatus for emission spectroscopic analysis comprising the apparatus for generating plasma as defined in claim 14.